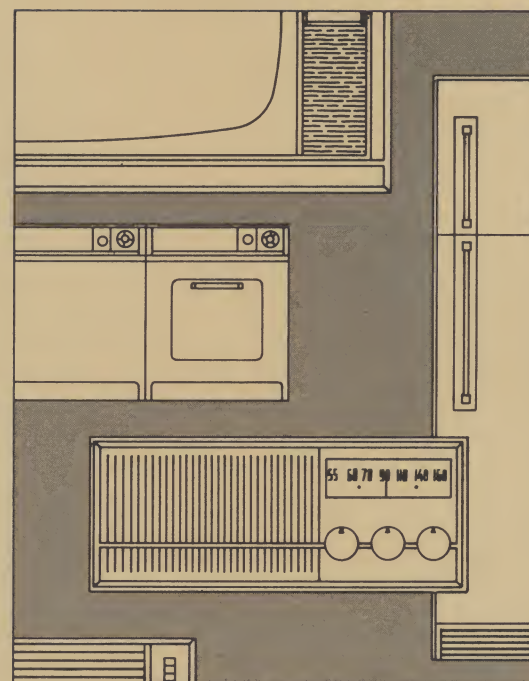


## GENERAL ELECTRIC USES TELETYPEWRITERS



to solve research problems  
 in real-time  
 via time-sharing computer





# case history:

General Electric Company's Appliance Park facility had long used computers in its research and design work. But because the engineers and scientists did not have direct access to the computer, there was considerable delay in processing data.

But now, as a result of Teletype Model 33 and 35 ASR (automatic send-receive) sets linked to a time-sharing computer, they can determine immediately the feasibility of ideas, new designs and engineering changes.

The story of how GE uses time-sharing to get real-time answers to problems is detailed here and in recent issues of several leading publications.

For information about leased services featuring Teletype equipment, consult your local telephone or telegraph company. To purchase equipment, contact us at our general offices address on the back cover.

When ordering input-output terminals for your data processing system, be sure to specify Teletype equipment—your vital communications link.

**GENERAL ELECTRIC COMPANY  
APPLIANCE PARK  
LOUISVILLE, KENTUCKY**





Appliance Park, world's largest major appliance manufacturing facility, Louisville, Ky. houses offices and manufacturing facilities for G.E. clothes washers and dryers, electric ranges, dishwashers, Disposalls, refrigerators, freezers and room air conditioners.

## ENGINEERS, SCIENTISTS AT G. E.'S APPLIANCE PARK LINKED TO TIME-SHARE COMPUTER VIA TELETYPEWRITERS

### SYSTEM OFFERS REAL-TIME ANSWERS TO PROBLEMS

By permitting engineers and scientists at Appliance Park to access a time-sharing computer via teletypewriters, General Electric Company is adding new dimensions to individual creativity and problem-solving skills.

Researchers and mathematicians are finding it possible to determine immediately the feasibility of ideas and designs. They are also able to check out modified products rapidly to establish the technical worth of engineering changes.

Appliance Park is the name given by General Electric to its manufacturing facility in the Louisville, Ky. area. Here, G.E.'s major appliances—ranges and ventilating hoods, refrigerators, freezers, automatic clothes washers and dryers, dishwashers, garbage disposal units and room air-conditioners—are produced.

Other General Electric major appliance and Hotpoint plants are located in Chicago, Illinois; Milwaukee, Wisconsin; Trenton, New Jersey; Tyler, Texas and Bloomington, Illinois.

### COMPUTERS USED FOR SOME TIME

The Louisville facility has for some time made individual use of various types of computers.

"Because our engineers and researchers did not have direct access to these computers, however, we were faced until recently with considerable delays in processing data," states Ernest Bianco, manager of the Division's Applied Mathematics Laboratory.\*

"But now," Bianco points out, "thanks to time-sharing computer service with teletypewriter links to the computer, we are able to do everything in one big gulp. And, because we are able to 'debug' programs before going on-line to the computer, we have virtually eliminated delays occasioned by errors."

What Bianco and his group are striving for is the use of computers to permit "management by exception"—i.e., using the computer to instantly uncover exceptional or unexpected data of any kind. Admittedly, such usage is still some time away.

"We're looking ahead toward direct-inquiry, even individual use, of the computer memory banks," Bianco says. Thus, a department manager, for example, could ask the computer what has changed—and receive in a moment information on what is significantly different from the traditional.

"Management too often equates data with information," says Bianco. "They are not synonymous, and there is too much of the former."

Appliance Park's early experience with time-sharing was via Bell System telephone lines to General Electric Information Processing Centers (IPC's) in New York, Phoenix and Valley Forge, Pa.

Then, early in 1966, the Louisville plant began to use exclusively the service of G.E.'s Information Processing Center in Chicago. It will continue to use these facilities until it has augmented its own computer complex.

\*Title at time this article was prepared. Bianco is now manager of new ventures planning at Appliance Park.



Engineers and scientists in the Applied Mathematics Laboratory at General Electric's Appliance Park are responsible for developing the computer programs for use in research activities. Here, statistician, Robert D. Mohr (right) works out a program with the aid of Robert B. Hadelor (left), a time-share mathematician.



#### **100-WPM TELETYPEWRITERS USED**

Twelve Teletype Model 33 and 35 ASR (automatic send-receive) sets are employed at Appliance Park to communicate with the G.E. service center in Chicago via Bell System Data-Phone Service. Embodied within these machines are a keyboard send-receive page printer, a paper tape punch, and a paper tape reader, which can be used in different combinations. Both sets operate at 100 words per minute (10 characters per second) and use the U.S.A. Standard Code for Information Interchange (ASCII).

Each of the teletypewriters is connected to voice-quality phone lines through the Bell System's "Common Control Switching Arrangement" (CCSA, which G.E. internally calls its "Dial Comm" system). In fact, this gives the company its own direct-dial telephone network.

Users of the service at Appliance Park, most of whom are engineers, have been schooled in "BASIC" computer language—an acronym for Beginners All-Purpose Symbolic Instruction Code developed by Dartmouth College with General Electric. This language is taught in a short course given by Appliance Park personnel and

available to all time-sharing service users from all G.E. centers.

The curriculum of the course includes familiarization with system commands; the start-up and calling sequence; the use of Teletype equipment in context with a computer; the "library" program (i.e., what programs are "on file" with the computer); the BASIC language, and finally, file editing (modification or alteration of programs already on punched tape).

"The BASIC language and the ubiquitous teletypewriter have helped establish a true man-machine interaction," states Bianco. "Empathy exists because of the high accessibility rate and the conversational mode used. Our engineers and scientists now have a real chance to express themselves analytically."

#### **PROGRAMS PUNCHED INTO PAPER TAPE**

To date, scores of different programs have been developed by the personnel at the Applied Mathematics Laboratory. Each has been punched into paper tape and is stored at a central location within the department. When an engineer desires to make use of a particular program, he merely inserts the program tape into the tape reader





Each computer program developed at the Applied Mathematics Laboratory is punched into paper tape by the operator of a Teletype Model 35 ASR (automatic send-receive) set, as demonstrated by Mrs. Betty Hall, computer programmer. Tapes are then stored until an engineer or scientist has application for a particular one, at which time the tape is inserted into the ASR set's tape reader and transmitted to the computer.



Computer program tapes are stored at a central location within the Applied Mathematics Laboratory. When a particular one is to be used, it is transmitted to the computer via a teletypewriter, as Mrs. Betty Hall, computer programmer, demonstrates.

of a Model 33 ASR set, which in most cases is near his desk.

Once the tape has been transmitted to the computer, the engineer is ready to begin asking predetermined questions to elicit analytical data. The entire "conversation" between man and computer is recorded as page copy on the ASR unit. If desired, a paper tape can be punched simultaneously to duplicate page copy; the tape is made whenever information will be processed through the computer at some future time.

The greatest use of G.E.'s Teletype machines in the current time-sharing program is for analysis—as opposed to cybernetic use, or the batch-processing of data in large amounts. A current example is a Refrigeration Department study that transmits to the computer test data on the engineering performance of experimental models,

comparing this data to that on file for the latest models in production.

Another use is for statistical analysis—dealing with tests of an inferential nature and utilizing the probability theory (i.e., given a complete set of circumstances or criteria, the computer will provide answers of the "this course of action is better than that" sort). The computer also is accessed for simulation studies by engineers—most recently of a mathematical building "model" to justify a suggested plant expansion.

#### ENGINEERS GIVEN FREE REIN

Bianco, who terms time-sharing "without doubt the greatest single achievement in the computer business today," underscores the fact that he does not supervise use of the Teletype computer-access equipment in the strict sense of the word.

"We watch only for excessive on-line time that indicates the user of the Teletype equipment has not done his 'homework' before going on-line," Bianco states. "'Heavy-handed' restrictions would negate all we have striven for in our present data communications setup."

"Getting file information on just what you want is an immeasurable benefit," continues Bianco. "In the future, I'm almost sure we'll see a proliferation here of remote terminal devices. The number, in fact, should double—and just as importantly, our uses of them will double. We'll be in possession of dynamic information—of the sort that would be represented by daily sales forecasts, if that were our concern.

"And the factor of analytical expressiveness," Bianco concludes, "will also continue to grow."





Engineers and scientists at Appliance Park communicate directly with the computer via a Teletype Model 33 ASR (automatic send-receive) set. The "conversation" is recorded as page copy, but a paper tape can be punched simultaneously. Shown here is Stuart R. Kunz, Specialist Engineering, Merchandized Information Systems.



Traffic flow into and out of the computer in Chicago is controlled by a G. E. Datnet-30 communications processor similar to the unit above located at Appliance Park. By next year, the Laboratory's work will be phased out of the Chicago facility and onto the Appliance Park data processing system. At right is Wayne Kepley, specialist in telecommunications applications, discussing new programming with analyst M. R. Salsman.

Data processing facilities at Appliance Park used by the Applied Mathematics Laboratory with similar equipment in Chicago.



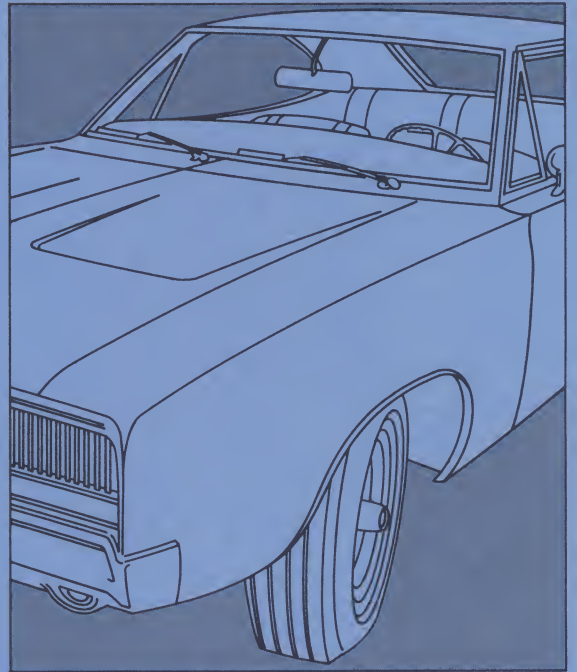


*machines that make data move*

**TELETYPE CORPORATION** • Skokie, Illinois • Little Rock, Arkansas • Washington, D.C.  
General Offices: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 676-1000 • TWX:  
910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service). Government  
Liaison Office: 425 Thirteenth Street, N.W., Washington, D.C. 20004 • Telephone: 202 ME 8-1016.

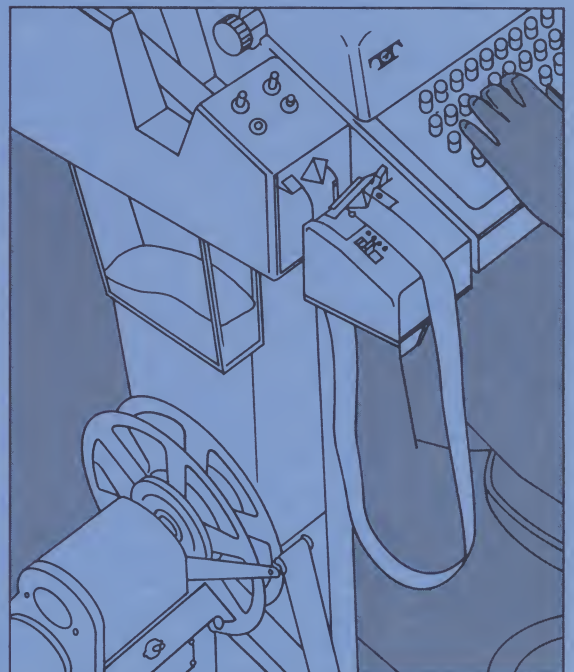
GE10M868  
Printed in U.S.A.





**CARS, INC. EMPLOYS  
TELETYPEWRITER LINK**

to process auto dealers'  
daily business overnight







# case history:

The retail automobile business has changed fast. About half as many dealers today as two decades ago now sell twice as many automobiles. And retail sales are predicted to total about 10.5 million cars by 1970.

No longer is a dealership a one-man operation. Today's dealer manages a staff of specialists. To assist him for a more profitable operation is a new service, CARS, Inc., that provides a modern automated accounting and inventory system.

By using a Teletype Model 33 ASR (automatic send-receive) set and a high speed paper tape reader, a dealer can have on his desk each morning a detailed operating report for the day before and for the month to date. With the same Teletype equipment, he reports his entire daily business activity for computer input and processing on an overnight basis.

Several leading magazines are featuring the story of this important service developed by CARS, Inc.

For information about leased services featuring Teletype equipment, consult your local telephone or telegraph company. Or, to purchase, contact our Sales Organization at the general offices address listed on the back cover.

When ordering input-output terminals for your data processing systems, be sure to specify Teletype equipment—your vital communications link.

**COMPUTERIZED AUTOMOTIVE  
REPORTING SERVICE, INC.  
BIRMINGHAM, ALABAMA**

## **AUTO DEALERS RECEIVE LOW-COST CONTROL REPORTS DAILY FROM COMPUTER VIA TELETYPEWRITER LINK**

### **EXCLUSIVE DATA HANDLING SERVICE PROVIDED BY CARS, INC.**

"People are more effective and management can make decisions based on facts."

This sweeping assertion is welcome news to all automobile dealers faced with piles of paper work when they hear about a new electronic data communications service for processing accurate profit and loss statements every day.

The comment comes from John Williamson, President of Computerized Automotive Reporting Service (CARS), Inc., and a franchised new car dealer.

Backing him up is Beverly P. Head, Jr., investment counselor and once general superintendent of a grocery chain where he learned about inventory and management control. Head is board chairman and one of the founders of CARS, Inc., along with James R. Forman, Jr., a Birmingham attorney, and Thomas W. Perry, general dealership operating manager for dealership enterprises associated with Williamson, Head, and Forman.

"Using a computer to do instantaneously what takes hours and hours of labor is the only way to go," is Head's comment.

What he and Williamson referred to at the Birmingham, Alabama, headquarters of CARS is how to handle the accelerating business of the automobile dealer so that the dealer knows what to do to remain competitive, increase the effective-

ness of his people, and to increase profits.

Nationwide, CARS, Inc. offers the automobile dealer—large or small—a fast, accurate daily operating and inventory control, and a management report service. It is keyed to Teletype equipment and regular business telephone service that transmit data between individual dealerships and a central on-line, semi-real time computer. The system was developed with assistance from Southern Bell Telephone and Telegraph Company data communications specialists.

The reports give the dealer facts with which to manage his business on a day-to-day and month-to-month basis—or when he needs them. And this service, in most instances, costs him less than the salaries of two experienced secretaries or office girls.

### **FEWER DEALERS, MORE BUSINESS**

When Williamson began searching for a better way to manage his dealerships in Alabama, Florida, Louisiana, and New Jersey about five years ago, he became aware of some revealing facts.

Less than 20 years ago about 49,000 auto dealers sold about four million cars annually. Today, about 28,000 dealers sell eight to nine million cars a year, and this number is expected to reach about 10.5 million in 1970. But only about the same number of dealers, or even fewer, will be doing this increased business—and paper work.

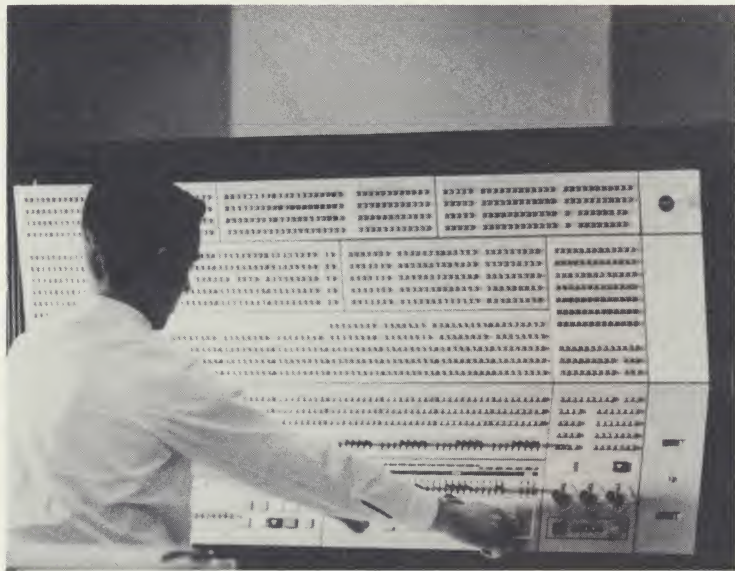
Concentration of more volume with fewer dealers has forced today's dealer from a near one-man operation into the role of a busi-



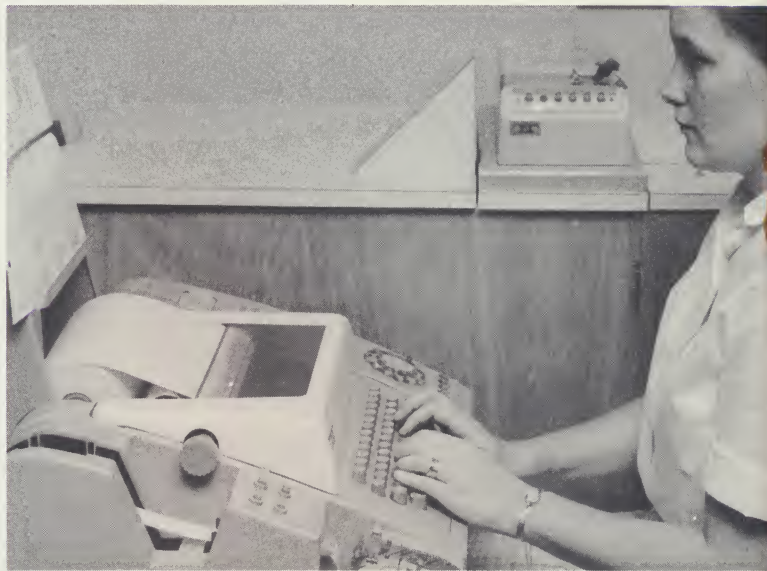
Beverly P. Head, Jr., chairman, and John Williamson, president (left), head CARS, Inc., which they developed to make business better through computerized record keeping for the nation's automobile dealers. CARS provides the only fully alphanumeric communications system for electronic data processing that is available to auto dealers.



At the computer center, the daily tape-coded transactions of six dealerships are received simultaneously over private business telephone lines. The computer contacts (polls) each dealership via Wide Area Telephone Service (WATS). There is no additional toll charge to the dealer. Bell System Data-Phone Service is employed for the high-speed, tape-to-tape transmission. It now takes about 25 minutes from initial transmission of the first dealer's data to the computer to the return of the last dealer's daily profit and loss statement to his office each morning.



Each daily transaction—from a parts ticket to a new car sale or bank deposit—is entered into the individual dealer's records from his office by a part-time operator using the compact Teletype Model 33 ASR (automatic send-receive) set. The typewriter-like keyboard allows the operator to punch a tape in proper form as data information is requested by a control tape. She sees on the teletypewriter page immediately what is punched in tape, and can correct any errors.



ness manager administering the services of a sales manager and salesmen, shop manager and mechanics, clerks and accountants.

Keeping costs down and profits up is a major responsibility and a challenge in this fiercely competitive business. Add to this the record keeping, including detailed monthly financial reports to the dealer's automobile manufacturer, and the problem becomes acute.

It became so serious a problem that the manufacturers in recent years have recommended automatic accounting and inventory control systems to their dealers to ease the work load, and have standardized reporting procedures.

In 1964, Head, Williamson, Forman and Perry, long-time personal friends and business associates, combined their experience and started work on an answer to the problem. Eventually they worked out a program and discussed it with automobile manufacturers and about 55 key dealers, their business managers, parts managers and auditors. From these discussions developed the final problem definition that resulted in the CARS, Inc., services.

One of the key needs that emerged was for an operating control report on a daily basis in time to be of real value to the dealer. This obviously meant utilization of fast, accurate two-way communications between an individual dealer and the CARS, Inc., computer center.

The solution was found through the use of Teletype communications equipment. This then made it possible last year for CARS, Inc., to put into operation a new electronic data processing service for individual dealers on an overnight basis. And it gave the dealer for the first time in this or any other industry, a daily operating control or a daily profit and loss statement.

### THREE SERVICES TO FIT NEEDS

Three basic dealer services are offered. Two of these are accounting and the third is parts inventory control.

One accounting service especially helps small dealerships. It provides all normal accounting data for monthly reports to the automobile manufacturer, and a limited daily operating control.

The second accounting service is more comprehensive for large dealerships. A daily operating control statement shows the dealer his cash flow inventory movement, department performance, and other operational data, along with normal accounting records and monthly analytical management reports. A dealership, with this service may receive up to 70 separate items that can be fed back to him daily and include anything he wants that is in his system.

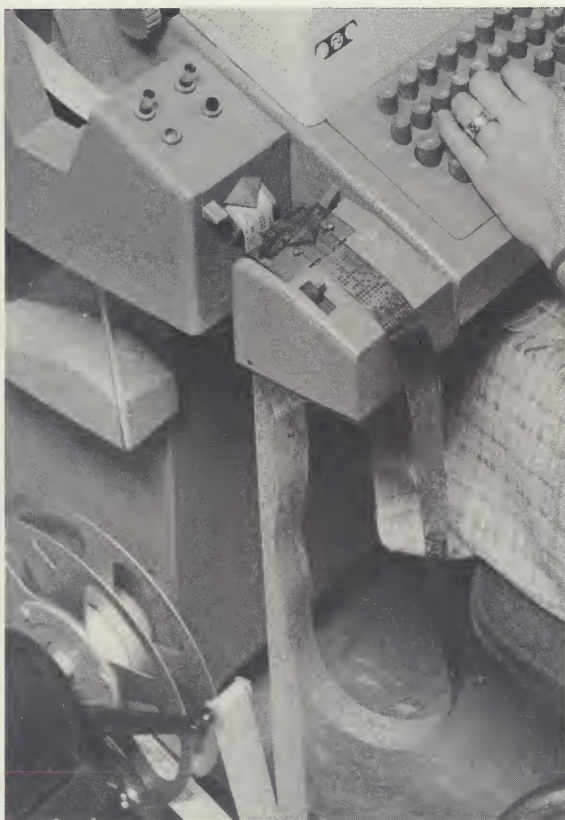
Parts inventory control and parts ordering services can be adapted to requirements of any size dealership.

All three services have optional features to fit needs of any dealer.

With this kind of information, many profit improvement opportunities are at hand for the progressive and profit-minded dealer. But unlike other reporting services, the CARS system has three significant advantages.

CARS offers the exclusive advantage of daily reports on an overnight basis without requiring a costly investment in computer equipment or in additional clerical and bookkeeping help.





One Buick dealership, for instance, needs only one girl part-time to prepare input information so that the computer can produce accounting information that it would take two and one-half additional full-time girls with some bookkeeping experience to produce without the CARS, Inc., system.

Another major dealership doing about \$8 million in annual sales, obtains its parts inventory control, all accounting and management records, and customer billings with input time taking only about four hours daily.

Prior to input, all documents are costed for entering into the system as each sale or service is completed. This is not nearly as time consuming, however, nor does it require the skill that bookkeeping and accounting records require.

Secondly, CARS offers the only alphanumeric system available in today's automobile market. This alphanumeric capability is of great importance to future data communication possibilities.

#### **ERROR-FREE OPERATION**

The third CARS advantage is the error-free operation of its system.

The continuous looped control tape repeats its questions automatically if more than one entry must be recorded for the same kind of transaction when data is prepared for computer processing. Each entry is treated as a separate and complete document. In a single operation, from the same typewriter-like keyboard, the Teletype equipment punches a separate tape that contains both questions and answers for transmission to the computer. The combination tape is wound on a reel (lower left) automatically as it is punched.

Although data is transmitted automatically at high speed to the computer and teletypewriter reports are returned at 100 words a minute, any business activity document out of balance is rejected by the computer and never gets into the system.

Not only is the erroneous document rejected, but the computer lets the dealer know the next morning which document is out of balance, and whether it is wrongly coded or has a bookkeeping error. Only when the correct information is supplied will the computer accept the data and incorporate it into the dealer's reports.

The efficiency of the operation lies in the use of Teletype equipment that CARS employs, and its automatic and unattended transmission capability.

Equipment for CARS service is installed and maintained by the dealer's local telephone company. The equipment package includes a Teletype Model 33 ASR (automatic send-receive) set and the Teletype high speed tape reader that transmits at 750 words a minute (75 characters a second). All transmission is via Bell System Data-Phone Service. The only charge which the dealer pays directly to the local telephone company is the regular monthly service charge for a private business phone line.

The ASR set's four-row keyboard is similar to that of a regular office typewriter and is easy for a good typist to use. The set incorporates a send-receive page printer, a paper tape punch and a paper tape reader. Operating at a speed of 100 words a minute, the unit uses the U.S.A. Standard Code for Information Interchange (ASCII).

#### **PRIVATE, AUTOMATIC TRANSMISSION**

In operation, the CARS computer at St. Louis, Missouri, and the individual dealerships communicate over each dealer's private business telephone line.

There are no telephone toll charges to the dealer. CARS utilizes Bell System Wide Area Telephone Service (WATS) lines. This permits the computer to call—or poll—six or more dealerships at a time for incoming data and to return completed individual reports, three or more at a time.

For feeding data to the computer, auto dealers punch all required daily accounting and inventory facts into a paper tape, using the Model 33 ASR keyboard. At the end of the business day, the tape is placed in the Teletype high-speed tape sender. Later that evening, the computer dials the dealer's number, causing automatic transmission of the tape. Incoming data is stored on a memory disc at the computer center until time for processing.

Once information is processed, it is sent back to the dealer via the same telephone circuit and printed out on his teletypewriter.

Information not required for the daily operating control report is stored on magnetic tape until the appropriate 10-day or monthly management reports are needed. These are printed out and mailed to the dealer as required.

It takes about 25 minutes of elapsed time for the computer to collect information from dealers, prepare reports and send them back.



CARS, Inc., teletypewriter control tapes are standardized for electronic accounting systems recommended by General Motors, Ford, and Chrysler. The tapes are kept handy in the storage cabinet that CARS provides to dealers. A single, combined control and information tape is transmitted by a compact Teletype high-speed, tape reader at 750 words a minute (75 characters a second).



#### BUILT-IN ACCURACY CONTROL

The CARS system uses a number of individual teletypewriter control tapes to ensure reporting accuracy when data is being prepared for transmission. The operator at the dealership uses a specific tape for each business activity and transaction. When operated in the ASR set's tape reader, it causes the page printer to type out questions (indicative information) one at a time for the data information the operator is to provide. The data is digitally coded for the computer's benefit.

Each control tape represents a complete single document, indicating the start and end of one transaction, i.e., a repair order, a parts counter ticket, a car invoice or any other business recorded during the day by the dealer's employees.

The operator types in the proper information requested, and can see immediately on page copy both the question and her answer. This is a visual check for errors, and she can correct any before they go into the system. Simultaneously, as the Teletype set prints out the control questions and the operator types

The dealer's daily transactions, punched into paper tape, are rewound on a storage reel, and the tape inserted in the Teletype high-speed tape sending unit. During the night, the tape transmitter is activated automatically by the central computer at St. Louis, Mo., where the data is received and processed. The transmitted tape feeds through a chute to a protective bin from which it is retrieved for temporary filing by the dealer. The cabinet provides file space for the page-print reports showing each day's data preparation.



out the answers, a single paper tape of the combined information is punched for actual transmission to the computer.

"With the Teletype equipment communications system," summarizes Head, "we can link the individual dealer's daily operations to a computer that can do more, do it faster, and with greater accuracy than by manual means. This frees people to handle other work and more business without the need to add personnel."

#### EVALUATES INDIVIDUAL PERFORMANCE

Even personnel performance can be measured. Management reports can show the dealer the business volume of individual salesmen, service advisors, and mechanics, and the amount of their profit contribution by the day, the month, and by type of transaction.

One of the management reports is a complete customer follow-up report which lists service, new car or used car, customers who have not been to the dealership in 90 to 120 days or in 120 to 150 days.

This report would also indicate to the service manager when to suggest car maintenance, or to the sales manager and his salesmen when to suggest a new car. Inventory reports on parts not only show the manager the turnover, but what and how much he should order to maintain a complete, but minimum inventory.

A special advantage for the accountant is detailed horizontal ledger posting with customers identified by name as well as by account number. And a special service provides for the preparation monthly of individual customer statements in quadruplicate or duplicate.

CARS has further dealer services under development for even greater efficiency. It is working and plans to install soon a direct ordering system so that through CARS the dealer may order his parts directly from the manufacturer. This will save a number of days in parts order transmission time. Another possibility is to transmit auto sales and warranty claims to a central computer which will relay the data to another computer for action and provide even more efficient operation.

Meanwhile, CARS offers the only service to automobile manufacturers and dealers that uses a high-speed, two-way Teletype equipment communications system with a full alphanumeric capability for electronic data processing. This two-way data communication is a basic requirement for future efficiency between the automobile dealer, his service computer center, and the manufacturer.

TELETYPE



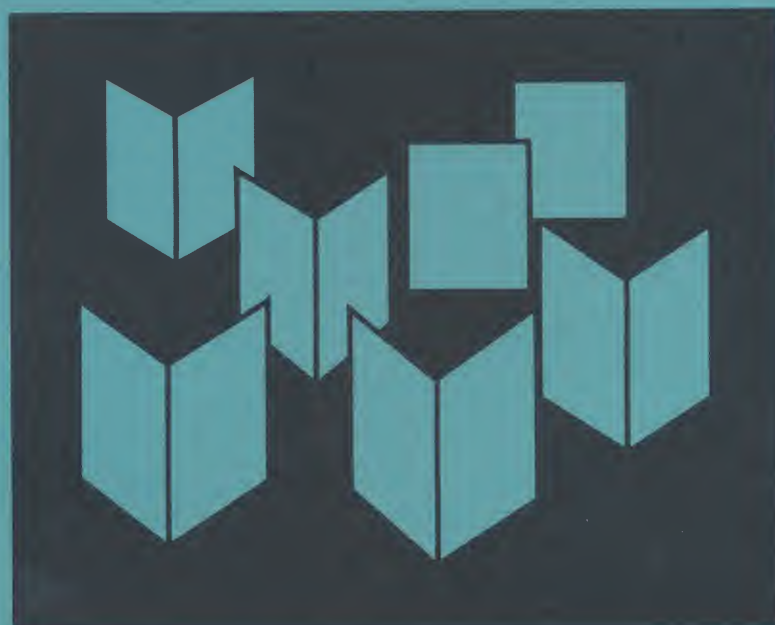
*machines that make data move*

**TELETYPE CORPORATION** • Skokie, Illinois • Little Rock, Arkansas • Washington, D.C.  
General Offices: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 676-1000 • TWX:  
910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service). Government  
Liaison Office: 425 Thirteenth Street, N.W., Washington, D.C. 20004 • Telephone: 202 ME 8-1016.

CARS10M868  
Printed in U.S.A.



**how to get answers  
to your questions  
about Teletype  
equipment**



What's new at Teletype? How is Teletype equipment being used in data communications today? What capabilities have been built into its terminals?

You'll find answers to these questions and many more in the descriptive literature listed below. Use the attached card to request any of the brochures you would like to have.

## about Teletype Corporation

**(1) WHERE THE DATA MOVEMENT STARTED brochure**—A capabilities brochure that tells about Teletype, its facilities, and latest product developments in data communications. (8 pages)

**(2) THE ABC'S OF TELETYPE EQUIPMENT brochure**—A primer on electronic transmission and permutation codes. Tells how data is sent and received by Teletype equipment, written in simple language and layman's terms. (16 pages)

## about Teletype® equipment

**(3) IT'S THE INKTRONIC® TERMINAL brochure**—Describes the latest in electronic, solid-state, high-speed terminal equipment. The Inktronic terminal is capable of sending and receiving up to 1200 words per minute. Prints electrostatically. Ink supply and guidance system has only one moving part. (16 pages)

**(4) MEET THE MODEL 37 brochure**—Gives details on a new line of heavy-duty automatic send-receive sets and page printers that operate at 150 words per minute. Model 37 types in upper and lower case; has an on-line tab-set capability; uses ASCII code; and has many unique features that enable it to handle the most complex forms of data with utmost efficiency. (16 pages)

**(5) TELETYPE MODEL 35 EQUIPMENT brochure**—The line of Model 35 heavy-duty page printers and automatic send-receive sets operates at 10 characters per second (100 words per minute) and uses ASCII. (14 pages)

**(6) TELETYPE MODEL 33 EQUIPMENT brochure**—These economical page

printers and automatic send-receive sets have a 4-row keyboard and operate at 100 wpm using ASCII. (12 pages)

**(7) TELETYPE MODEL 32 EQUIPMENT brochure**—This line of low cost page printers and automatic send-receive sets has a 3-row keyboard and operates on a 5-level code. (8 pages)

**(8) TELETYPE HIGH-SPEED PAPER TAPE READERS information sheet**—New DX series of readers can read punched paper tape at rate of up to 360 cps (3600 wpm). Code insensitive. Asynchronous. Self-contained. (2 pages)

**(9) MAGNETIC TAPE DATA TERMINALS information sheet**—These terminals send and receive data on-line at speeds up to 2400 wpm using handy cartridges of 1/2" magnetic tape. Can be used as a stand-alone terminal, or in conjunction with Teletype model 33, 35, 37, or Inktronic terminals. (2 pages)

**(10) TELETYPE MODEL 33 NUMERIC KEYBOARD ASR SET brochure**—This set has a numeric keyboard. It can be efficiently used in chain stores or wherever there is a need for fast and economical numeric data communications. (12 pages)





**(11) TELESPEED 1200 EDC brochure**—This high-speed tape-to-tape equipment has automatic error detection and correction capabilities and operates at up to 120 char/sec (1200 wpm). (14 pages)

**(12) TELESPEED 1050 brochure**—These high-speed tape-to-tape sets transmit and receive data at 105 char/sec (1050 wpm). The punched paper tape can be stored, fed into a computer, or processed in any way that is needed. (12 pages)

**(13) TELESPEED 750 brochure**—This economical tape-to-tape equipment operates at 75 char/sec (750 wpm). Besides discussing floor model sending and receiving sets, the brochure also describes the table-mounted sending set. (8 pages)

**(14) TELETYPE DRPE HIGH-SPEED PAPER TAPE PUNCH brochure**—This high-speed punch can receive and punch characters in paper tape at any speed up to 240 char/sec (2400 wpm) without any changes or readjustments. It punches 10 characters to the inch and is code insensitive. (8 pages)

**(15) TELETYPE BRPE HIGH-SPEED PAPER TAPE PUNCH information**

**sheet**—This high-speed punch operates at 105 char/sec (1050 wpm) produces punched tape at 10 characters to the inch and is code insensitive. (2 pages)

**(16) TELETYPE MODEL 35 ROTR brochure**—This 8-level self-contained typing paper tape punch receives data at 10 char/sec (100 wpm) and produces punched tape at 10 characters to the inch. (6 pages)

**(17) TELETYPE LPR TYPING PAPER TAPE PUNCH information sheet**—This is a 5-level receive-only punch designed to punch and print information in tape simultaneously. Operates at 10 char/sec (100 wpm). Spacing is 10 characters to the inch. (2 pages)

**(18) TELETYPE LOW-SPEED PAPER TAPE READERS brochure**—These electromechanical paper tape readers are code insensitive. Normal operating speed is 10 char/sec (100 wpm). They can read tape punched at 10 characters to the inch. They can read 11/16, 7/8, or 1 inch paper tape. (10 pages)

**(19) STUNTRONIC ACCESSORIES SA-110, SA-120 information sheet**—Covers new, lost-cost, solid-state accessories that "tune in" signals and detect vertical parity errors in the data

system. For use with Model 33, 35, 37, Telespeed and Inktronic terminals. (2 pages)

**(20) STUNTRONIC ACCESSORIES SA-130, SA-140 information sheet**—Describes Teletype's new solid-state logic modules that provide station interface, control and response with Model 33, 35, 37, Telespeed, and Inktronic terminals. Help establish efficient, economical and automatic control over the entire data system. (2 pages)

## about applications

**(21) TIME-SHARING brochure**—An informative discussion on how Teletype equipment is being used as input-output devices in computer time-sharing applications. (8 pages)

**(22) TELETYPE TERMINALS BRING THE COMPUTER TO STUDENTS OF ALL AGES information sheet**—Tells how Teletype equipment is being used in conjunction with computer assisted instruction programs. Covers applications in primary grades, high school and universities. Describes a number of terminals being used. (2 pages)

## case histories (All 8-pages)

**(23) WALKER MANUFACTURING COMPANY**—Demonstration of how this Wisconsin manufacturer employs Teletype equipment to link manufacturing plants and distribution centers. And in handling orders, customer inquiries, and to automate inventory control.

**(24) TRAFFIC COUNSEL OF AMERICA, INC.**—Tells how a unique data processing center in Canton, Ohio, supplies its customers with 60-second service on complicated freight bills and bills of lading involving major shipments. Teletype terminals provide the necessary speed-of-communications as taped information is sent to the center, computer-processed, and returned inside of one minute with correct rates, routes and interline charges.

**(25) GIBSON GREETING CARDS, INC.**—Tells how this company uses Teletype terminal equipment and computer to gear order processing and production to meet usual peak demand. 80% of the annual output of the operation is sold in a few short weeks of every year.

**(26) ARMCO STEEL CORPORATION**—This company's nationwide teleprinter network coupled with a third generation computer enables Armco to process over 10,000 messages, orders, and shipping details every day. Average turn-around time per customer inquiry is 45 minutes.

**(27) LIGHTING PRODUCTS DIVISION OF LEAR SIEGLER, INC.**—This company found a teleprinter net-

work the right answer for faster more accurate order processing, inventory control, credit checking and invoicing. They use Teletype equipment to coordinate communications between six warehouses and more than 700 salesmen and representatives.

**(28) MARATHON OIL COMPANY**—This brochure describes how Marathon Oil mails invoices the day after sales are made—keeps tight control over the inventory at the distribution terminals using a Teletype terminal network.

**(29) U.S. STONWARE, INC.**—The key to fast, error-free order processing and invoicing for this company is Teletype CARData equipment. By combining a CARData reader with a Teletype Model 35 ASR, the operator quickly punches an accurate tape containing all necessary order information.

**(30) LOS ANGELES COUNTY**—The Los Angeles County Department of Public Social Services maintains 18 major district offices and 13 sub-offices to provide local community contact points for people receiving or seeking public aid. A network of Teletype 35 Automatic Send-Receive sets used with computer processing helps speed data flow.

**(31) GENERAL ELECTRIC**—Scientists and engineers at GE's Louisville, Kentucky, Appliance Park, now solve research problems using teleprinters linked to a time-sharing computer. Product analysis and research are not only speeded up but rendered more accurate.

**(32) CARS, INC.**—Computerized Automotive Reporting Service of Birmingham, Alabama—known as CARS, Inc.—provides modern, automated accounting and inventory systems for automobile dealerships. A Teletype Model 33 ASR set and a Teletype high-speed paper tape reader are all the dealer needs to take advantage of the service. Comprehensive daily and monthly business reports are sent to dealers every day, based on the previous day's data recorded on tape and sent in for overnight processing.

**(33) WILLIAMS BROTHERS PIPE LINE COMPANY**—Describes how this firm relies on fast, accurate data flow via Teletype equipment to route 357,000 barrels of refined petroleum products through thousands of miles of pipeline each day.

**(34) KENNAMETAL, INC.**—How can a company join its many sales offices, plants, and warehouses into one cohesive, smooth-working system of order processing and production control? This progressive hard-metals manufacturer developed "Kenstar", a modern data communications system using various Teletype terminals, polling equipment and high speed, tape-to-tape equipment.

**(35) KAISER CEMENT & GYPSUM CORPORATION**—This firm helped solve an unfavorable cash flow problem with a multi-faceted communications system that speeded up payroll, order and billing procedures. The system based on high-speed Teletype data terminals connects Kaiser's corporate

headquarters in Oakland, California with its many plants and distribution centers around the country (including Hawaii).

**(36) B. F. GOODRICH INDUSTRIAL PRODUCTS COMPANY**—A data communications network of Teletype terminals assure that more than 11,000 items are quickly available to thousands of B. F. Goodrich customers. The system incorporates teleprinters in combination with high speed tape-to-tape equipment between 11 warehouses and the firm's Akron headquarters.

**(37) INLAND UNDERGROUND FACILITIES, DIVISION OF BEATRICE FOODS COMPANY** — How this firm uses a network of Teletype equipment to maintain error-free inventory, order and shipment control of more than 4,000 tons of food in transit each day. Teletype terminals link shipments to a 100-acre underground warehouse and storage complex.

**(38) NATIONAL FOODS**—A chain of food stores shows grocers how to beat the old supply-demand guessing game. Substituting a data network of teleprinters for the "mark sense" system, National has eliminated errors in placing orders and overstocking, and reduced inventories both at the stores and at the warehouse.

**(39) S&W FINE FOODS, INC.** — This leading food processor and distributor employs a variety of Teletype data terminals tied to a central computer to link its widespread operations. The national data communications system has speeded order delivery, reduced inventory time, and lowered warehouse inventory levels.

**(40) A TOTAL INFORMATION SYSTEM FOR EDUCATIONAL SYSTEMS**—An important study on how data processing can improve the quality of education. Project OTIS (Oregon Total Information System) utilized Teletype data communication terminals and time-sharing computers to chart student progress, profile school district finances, and discover critical relations between various education programs.

**(41) MISSISSIPPI CAI (COMPUTER ASSISTED INSTRUCTION) SCHOOL PROGRAM**—A report on how CAI is helping disadvantaged students in McComb, Mississippi learn math. Teletype data communications terminals link students with a California-based computer that provides individualized drill instruction at each student's best rate of learning.

**(42) THREE MEDICAL CASE HISTORIES: (1) U.S. PUBLIC HEALTH SERVICE (2) BLUE CROSS/BLUE SHIELD (3) EPPLEY CANCER RESEARCH INSTITUTE**—Three case histories relate how high speed Teletype equipment is playing a vital role in all phases of modern medicine, whether diagnostic or administrative. Material ranges from the use of Teletype data terminals in interpreting electrocardiograms to handling thousands of admittance approvals for 20 state-wide hospitals to their importance in a sophisticated system of cancer detection.

## Fill Out Card for More Answers

☐ Send sales literature as follows: (circle code number of brochure desired)

1	6	11	16	21	26	31	36	41
2	7	12	17	22	27	32	37	42
3	8	13	18	23	28	33	38	
4	9	14	19	24	29	34	39	
5	10	15	20	25	30	35	40	

☐ Have Teletype Applications Consultant phone

☐ Send price and delivery information on

(PRODUCT)

☐ Put me on your mailing list

☐ Other

Name

Title or Function

Company

Street Address

City, State, Zip Code

Telephone (area code) (number)

## Fill Out Card for More Answers

☐ Send sales literature as follows: (circle code number of brochure desired)

1	6	11	16	21	26	31	36	41
2	7	12	17	22	27	32	37	42
3	8	13	18	23	28	33	38	
4	9	14	19	24	29	34	39	
5	10	15	20	25	30	35	40	

☐ Have Teletype Applications Consultant phone

☐ Send price and delivery information on

(PRODUCT)

☐ Put me on your mailing list

☐ Other

Name

Title or Function

Company

Street Address

City, State, Zip Code

Telephone (area code) (number)



Postage Will Be Paid By Addressee

**BUSINESS REPLY MAIL**

No Postage Stamp Necessary if Mailed in the United States

FIRST CLASS  
Permit No. 480  
Skokie, Illinois

Postage Will Be Paid By Addressee

**BUSINESS REPLY MAIL**

No Postage Stamp Necessary if Mailed in the United States

FIRST CLASS  
Permit No. 480  
Skokie, Illinois

**TELETYPE CORPORATION**

Department 1143

5555 Touhy Avenue

Skokie, Illinois 60076

**TELETYPE CORPORATION**

Department 1143

5555 Touhy Avenue

Skokie, Illinois 60076



*machines that make data move*

**TELETYPE CORPORATION** • Skokie, Illinois • Little Rock, Arkansas • Washington, D.C.  
General Offices: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 676-1000 TWX:  
910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service). Government  
Liaison Office: 425 Thirteenth Street, N.W., Washington, D.C. 20004 • Telephone: 202 ME 8-1016.





## **FROM TELETYPE...**

# ***a new line of magnetic tape data terminals***

### **adds high speed on-line capability to low speed data terminals**

Now you can solve the problem of handling a growing data volume with low speed terminals. How? With Teletype's new 4210 Magnetic Tape Data Terminal. This terminal functions just like a paper tape punch and reader. Only there's an important difference. The 4210 uses magnetic tape cartridges instead of paper tape rolls. And it's fast. So fast that it can handle data distribution and collection at speeds up to 2400 words per minute. Great for any application where data build-up demands high speed handling. Great, too, for computer input/output where line time should be minimized.

### **Turn-around capability saves line time and costs**

Talk about line time efficiency. The Teletype® 4210 Magnetic Tape Data Terminal automatically switches to the receive mode on completion of sending. That feature benefits almost any application. Here's just one: After hours a central warehouse computer calls in the 4210 at a retail outlet for transmission of the day's transactions. The 4210 (having batched this data on the tape cartridge) sends it to the computer. Upon completion, the 4210 automatically switches to the "receive" mode so the computer can send administrative data that will be recorded on the remaining tape in the cartridge. The whole operation is done on the same call. And unattended. This turn-around capability of the 4210 means across-the-board savings in line time and costs.

### **Dual speed versatility**

Imagine, by using the 4210 Magnetic Tape Data Terminal you can transmit and receive at high speeds. But the 4210 doesn't stop there. It also provides you with print-out capability by interfacing with most Teletype low and high speed terminals.

### **Cartridges simplify tape handling**

In fact, it couldn't be much easier. You merely place the cartridge onto the tape deck and follow up with an easy in-line threading sequence. You're ready to record. Any number of messages—up to 150,000 characters—can be stored on a single cartridge. That's equal to more than a 1000-foot roll of paper tape. Moreover, since you can erase (if you wish) any information on magnetic tape, a single cartridge can be re-used indefinitely. A special device prevents accidental erasure.



### **Easy editing**

Error correction is beautifully simple on the 4210 Magnetic Tape Data Terminal. A single spacing control permits you to move the tape, in forward or reverse direction, one character at a time. Then you just record the correct character over the erroneous one. That does it.

### **Locating data also easy**

Want to find a particular message or block of data? No problem. Simply flick a switch to the appropriate pre-selected character, press a button and you can search at the rate of 400 characters per second. Either forward or reverse. Tape automatically stops at the character you selected. There are four pre-selected characters (plus three programmable characters that are optional). For greater speed in moving the tape, a fast forward and reverse control lets you run the tape at about 4000 characters per second. An associated digital counter serves as an approximate reference of tape position.



## Functional control panel

All basic operations of the 4210 Magnetic Tape Data Terminal are handled through a convenient control panel. In addition to the features already mentioned, this control panel allows you to do the following:

- Select On-line (Manual or Automatic-Answer) or Local modes.
- Remove the unit at any time from the search, send, or receive modes, and place it in an "idle" condition.
- Rewind tape rapidly into the cartridge.

The control panel also provides helpful indicators in addition to the digital counter:

- Error Lamp—Indicates incorrect vertical parity of character in "Send," "Search," or "Single Step" modes.
- Tape Position Lamp—Indicates beginning of tape, end of tape, and when tape supply is low.

## Compatible with Teletype equipment line

The 4210 Magnetic Tape Data Terminal line is designed for use with any Teletype equipment using the ASCII code. This includes Model 33, Model 35 and Model 37 teleprinters, and the Inktronic® I/O terminal. The 4210 blends perfectly with the styling of your existing Teletype terminals.

### Technical Information

#### Speed

Up to 2400 wpm (240 characters per second)

#### Code

ASCII (7 information, 1 parity)

#### Tape

1/2" precision magnetic tape (approximately 100 ft. in a 3" x 3" x 1" cartridge)

#### Cartridge Capacity

150,000 characters

#### Recording

MRB (Modified Return to Bias)—9 track (8 data, 1 clock) 125 characters per inch

#### Dimensions/Weight

STYLED FOR:	W	H	D
M33/35 Terminals	12"	29"	23"
M37 Terminal	12"	30"	23"
Inktronic I/O Terminal	12"	32"	24"

Approximately 55 lbs.

#### Power

Approximately 150 watts idle, and 200 watts operating  
115 VAC  $\pm 10\%$   
60 Hz  $\pm 0.5$  Hz  
or  
50 Hz  $\pm 0.5$  Hz

#### Interface

Serial start/stop through EIA standard RS-232-B  
Parallel interface to Inktronic I/O Terminal  
(Uses Inktronic Terminal on-line interface)

#### Temperature & Humidity

40° to 110° F  
95% Humidity maximum



## For More Information About . . .

LEASED SERVICES featuring Teletype 4210 Magnetic Tape Data Terminals, consult your local communication services company.

PURCHASING (or general information) about Teletype equipment, contact our Sales Organization at the general offices address listed below.

When ordering input-output terminals for your DATA PROCESSING SYSTEM, be sure to specify Teletype equipment—your vital communications link.



Adds "ASR" versatility to the Inktronic terminal at speeds up to 1200 wpm.

*machines that make data move*



**TELETYPE CORPORATION** • Skokie, Illinois • Little Rock, Arkansas • Washington, D.C.  
General Offices: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 676-1000 • TWX: 910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service). Government Liaison Office: 425 Thirteenth Street, N.W., Washington, D.C. 20004 • Telephone: 202 ME 8-1016.





*It's the  
Inktronic®  
terminal*



Inktronic RO (receive-only) set



Inktronic KSR (keyboard send-receive) set

### —a new line of high speed, electronic data terminals from Teletype

This Teletype heavy-duty, solid-state printer is different. Non impact printing. It jets characters to the page at up to 120 characters per second. Many times faster than ordinary page printers. And costs much less than you might imagine. Future plans call for even higher speeds for complete utilization of voice grade channels.

#### Fires charged ink particles

Characters are formed from electronically controlled ink nozzles. Each ink droplet carries a negative charge. When the ink is drawn out of the nozzle by the valving electrode and directed through two different pairs of electrodes, as shown above, the droplets are deflected vertically and horizontally to trace out characters. Each character is actually made up of a series of dots of ink that together form a continuous line.

The Inktronic printer prints one character at a time. Prints one letter lines as readily as entire lines. The Inktronic printer requires no buffer storage and is able to intermingle long and short printed lines without the use of fill characters.

There are 40 ink nozzles used in the maximum line of 80 characters. Each nozzle remains stationary

and is responsible for two characters. The ink supply and guidance system has only one moving part. And all of the parts normally found in a printer's carriage return have been eliminated—all of which means very little maintenance is required to give you truly quiet operation.

#### High-speed, on-line computer input/output

An Inktronic KSR (keyboard send-receive) set can be used effectively for rapid computer interrogation, especially in time-sharing systems where computer and line time should be kept at a minimum. Inktronic RO (receive-only) sets serve well as computer output devices when large volumes of data are required in a short period of time. They are extremely useful for monitoring of high-speed tape-to-tape systems, too.

#### Code compatible

Inktronic equipment will generate up to 128 code combinations of which 63 alphanumerics (plus SPACE) can be printed. The Inktronic RO may be arranged for use with either the 5-level code, or U.S.A. Standard Code for Information Interchange (ASCII). The Inktronic KSR will use ASCII. An Inktronic ASR (automatic send-receive) set will be available.



## A few words about ink and paper

The Inktronic printer uses ordinary teletypewriter paper. Inexpensive paper. A roll provides about 400 feet of space to fill. The ink it uses is inexpensive, too. One pint will deliver about 80,000 feet of data. With 1200 word per minute capability, this is an important point to consider. The ink used in the Inktronic terminal is easier to load than a typewriter ribbon. Paper replacement is easy, too—even when the set is flanked by other equipment or office furniture. And it displays at least 11 inches of copy.

## MORE INFORMATION

You can obtain additional information by contacting our Sales Organization at the general office address listed below.

(shown half size)

1 2 3 4 5 6 7 8  
123456789012345678901234567890123456789012345678901234567890

THIS IS AN EXAMPLE OF WHAT THE NEW INKTRONIC TERMINAL CAN MEAN TO YOUR DATA COMMUNICATIONS.

SEVENTY-TWO OR EIGHTY CHARACTERS CAN BE PRINTED ON A LINE

...AND YOU CAN START PRINTING ANYWHERE.

ON THE LEFT

IN THE MIDDLE

ANYWHERE

IN A SECOND, ONE HUNDRED AND TWENTY CHARACTERS JET TO THE PAGE. THAT'S AS MANY LETTERS AS THIS PARAGRAPH CONTAINS.

YOU CAN PRINT NUMBERS 12345 67890

OR SIGN LANGUAGE

..\*%Z-&'()\*!?:/@

IN A CHOICE OF CODE:

5-LEVEL OR ASCII

AND BEST OF ALL, THE INKTRONIC TERMINAL DOESN'T COST VERY MUCH!

\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$  
\$ . . . \$  
\$ . . . \$  
\$ . . . \$  
\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$

## INKTRONIC TERMINAL TECHNICAL INFORMATION

### Speed

- 1200 wpm (120 characters per second, or 1200 bauds)
- 1050 wpm (105 characters per second, or 1050 bauds)

Future plans call for even higher speeds for complete utilization of voice grade channels.

### Code

- RO—ASCII (7 information bits, 1 parity bit), 10 unit.
- 5-level, 10 unit.
- KSR—ASCII (7 information bits, 1 parity bit), 10 unit.

### Temperature

- operating: 40°—110°F ambient with humidity: 95% max.

### Printer

- friction feed platen
- maximum line of 80 characters
- horizontal spacing 10 characters per inch
- vertical spacing 6 lines per inch

### Approximate Dimensions & Weight

- RO: 18-in. wide, 27-in. deep, 47<sup>3</sup>/<sub>4</sub>-in. high, 55-in. high with paper winder; 300 lbs.
- KSR: 36-in. wide, 30-in. deep, 33<sup>1</sup>/<sub>2</sub>-in. high; 320 lbs.

### Keyboard

- full ASCII keyboard (can generate up to 128 characters). Similar to typewriter.

### Paper

- ordinary 8<sup>1</sup>/<sub>2</sub> in. wide teletypewriter paper; 4<sup>1</sup>/<sub>2</sub> in. diameter roll (friction feed)  
(A standard 400 ft. roll of 8<sup>1</sup>/<sub>2</sub> in. wide paper will last for approximately 5 hours at 1,050 wpm when printing 80 character lines)

### Ink Supply

- a pint of ink will print approximately 200 rolls of paper printing 80 character lines, and will provide for 1000-1500 hrs. of printing at 1200 wpm.

### Interface Information

- with proper data set can transmit over voice grade channels.
- serial start/stop through EIA RS-232-B interface.
- parallel signal through contact interface (RO only)

### Power Requirements

- approximately 600 watts; 115 V AC ±10%, 60 Hz ±0.5 Hz. Set is fused for 8 amps.

*machines that make data move*

TELETYPE CORPORATION • Skokie, Illinois • Little Rock, Arkansas • Washington, D.C.  
General Offices: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 676-1000 • TWX: 910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service). Government Liaison Office: 425 Thirteenth Street, N.W., Washington, D.C. 20004 • Telephone: 202 ME 8-1016.



TELETYPE



®



where the data movement started  
and startling moves are being made...



# Data:

Business, industry, and government seldom make a move without moving a variety of bits and pieces of information. For it's this intelligence that decisions are made of. Decisions to act. React. Stop. Go. Or change directions. This is our business. Helping man collect, integrate, and distribute data. Quickly. Reliably. Accurately. At extremely low cost. *Providing equipment that not only meets the data needs of today, but that has the capabilities to meet the demands of tomorrow.*

## **R & D**

Teletype maintains a complex of separate laboratories in its research and development program. Manned by scientists, engineers, chemists, and mathematicians. Men who are probing deep into electronic logic, mechanisms, systems, solid state devices, transmission capabilities . . . tackling problems of environmental conditions, noise, speed and switching. Creating new and better ways to meet man's insatiable desire to generate, move, and utilize the data he needs to increase his productivity.

## **Engineers of Manufacturing**

A high percentage of Teletype employees are involved

in the manufacturing/engineering area. Applying the latest techniques and processes. Developing data communications terminals that withstand the most demanding application requirements. Tenacious terminals that go on and on with minimum maintenance problems. Teletype's stress on engineering of manufacturing is a prime reason your data communications investment is far less and delivers a greater return when Teletype terminals are designed into your data communications system.

## **Application Consultants**

Teletype application consultants help solve thousands of data communication problems every year. Have an intimate knowledge of data management planning. Have the equipment and know-how needed to satisfy the most unique aspects of data handling operations. These men are at your service. Ready to help you obtain maximum communications effectiveness. You'll find no better source for ideas, equipment, and results.

# Teletype

. . . meeting today's data communications needs for . . .

**...speed and quiet** The Inktronic® terminal: An electronic, solid state printer. Quiet. Jets the message to the page at speeds up to 1200 words per minute—tomorrow it will be even faster. The ink guidance system has no moving parts. Prints through electrostatic deflection. On ordinary, inexpensive paper. It is used as a monitoring device for high-speed tape-to-tape systems. As a computer output terminal where large volumes of printed data must be produced economically. As an input and interrogation tool for computer communications. In addition to the RO (receive-only) set shown, KSR (keyboard send-receive) sets and ASR (automatic send-receive) sets will soon be available.



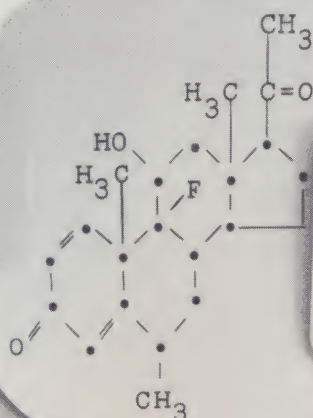


## ...flexibility

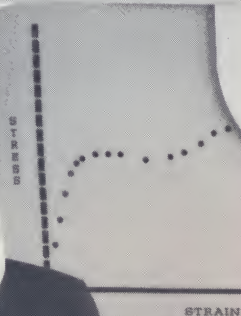
The most versatile of all data terminals: The Model 37. In performance, design, or capabilities it has no peer. Sends and receives up to 150 words per minute in ASCII (U.S.A. Standard Code for Information Interchange). Types in upper and lower case. Prints two colors. Handles text, figures, equations, chemical formulae, tabular material, charts or graphs with equal facility. With the Model 37 an operator can set tabs on-line. Advance forms in any number of remote locations and fill them in. The unit is also an ideal computer input/output terminal. Automatic send-receive with paper tape handling facilities, keyboard send-receive, and receive-only sets give you a complete data communications capability.



$$(a + b)^2 = a^2 + 2ab + b^2$$



THE QUICK BROWN FOX  
 jumped over the LAZY DOGS BACK  
 The Quick Brown Fox  
 JUMPED OVER the Lazy Dogs Back



## ...high-speed tape transmission

Telespeed high-speed tape-to-tape systems can send and receive a whole day's data accumulation in minutes. Inexpensively. Feed a computer ten, fifteen, twenty times faster than copy can be manually typed. Move large volumes of data unattended. Provide automatic error detection and correction. Teletype offers Telespeed terminals that communicate at speeds from 750 to 1200 words per minute. They are being used to exchange data with central on-line computers, in point-to-point data exchange in any number of remote locations.





**...accuracy** The Teletype Model 35 (ACS) Automated Communications Set with verifier. Helps speed up the tedious task of filling forms. Helps eliminate errors and costly mistakes. The key to the operation is the verifier control: A "private eye" that shadows the hordes of variable information which must go down on paper correctly. The set has two tape readers that inter-operate at programmed intervals to get both fixed and variable information to the right place at the right time on the form without wasted time, motion or mistakes. The Model 35 ACS can be used to transmit business forms on-line to any number of remote locations. The Model 35 ACS comes from a family of heavy-duty data terminals, the Model 35 line, which includes ASR, KSR, and RO sets.





### ...economy

The Teletype Model 33 line. A way to get a data communications system off the ground fast. Keep data flying reliably at extremely low cost. An integrated terminal line with all of the options needed to assure fast, accurate data flow. The Model 33 operates at 100 words per minute with the ASCII code. You can use it for computer input/output, with many other business machines, or as a data link between any number of remote locations. And the cost of this terminal will surprise you. So will the cost of its operation. Both are really economical.





# How Teletype Equipment is Being Used

**Time-Sharing.** Teletype terminals are being used in a variety of ways in computer time-sharing applications, enabling man to obtain real time or instantaneous answers to problems even though he may be a mile or thousands of miles from the computer.

**Order Processing.** Teletype terminal networks are helping numerous companies automate order processing, maintain inventories, prepare invoicing. One network, for example, coordinates activities of over 700 salesmen in fifty states and Canada.

**Education.** There are a variety of computer assisted instruction programs being carried out in primary grades, high schools and universities using Teletype terminals as input/output devices. Algebra, physics, computer science, math, basic reading, spelling and arithmetic are among subjects being taught.

**Medicine.** A group of Kansas hospitals use Teletype equipment to send pathological and radiologi-

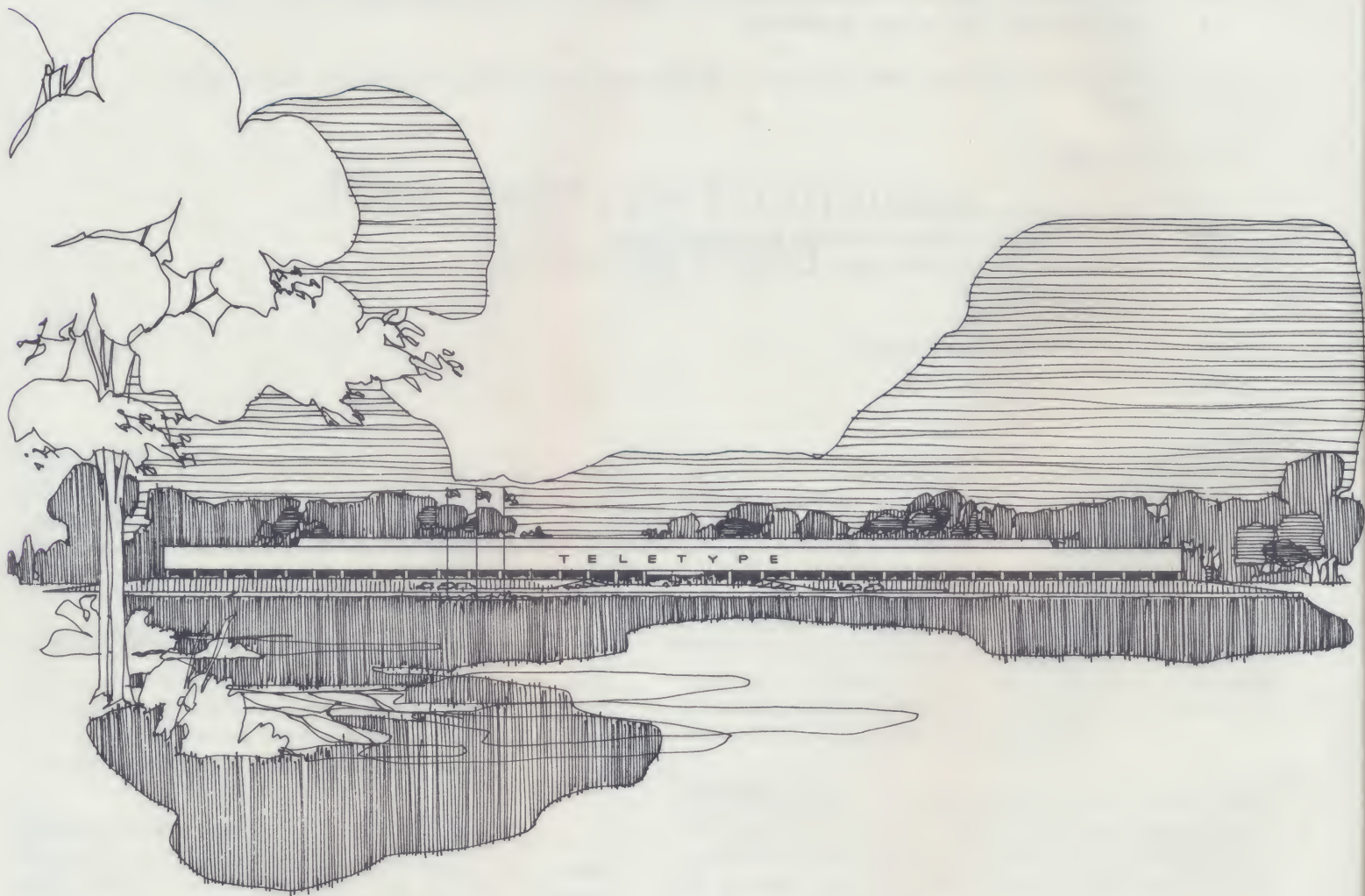
cal tests to a central laboratory. Obtain written analysis faster. Hospitals use Teletype equipment to improve handling of administrative reports and centralize purchasing of supplies.

**Manufacturing.** In the assembly line of today's leading automobile manufacturers, Teletype equipment maintains split-second coordination of all assembly points. Helps assure proper parts and accessories arrive where and when needed.

**Marketing.** A major steel producer with multi-plant facilities uses a Teletype network to handle over 10,000 messages, orders, and shipping data daily. Have cut average turn-around time per customer inquiry from days to 45 minutes.

**Space Exploration.** On every one of our nation's manned spaceflights, Teletype equipment has served as the communications link between the worldwide network of 18 tracking stations and the flight control center.





Teletype plant, Little Rock, Arkansas

# this is only a part of the story

. . . for Teletype is making many moves in moving data at very little cost. That's all we're really concerned with—economical, versatile and incomparably reliable data communications equipment.

Teletype has terminals and accessory equipment for practically every data communication system requirement. For more information about:

**LEASED SERVICES**, consult your local telephone or telegraph company.

**PURCHASING** (or general information) about this or any Teletype equipment, contact our Sales Organization at the general offices address shown below.

When ordering input-output terminals for your **DATA PROCESSING SYSTEM**, be sure to specify Teletype equipment—your vital communications link.

*machines that make data move*

**TELETYPE CORPORATION** • Skokie, Illinois • Little Rock, Arkansas • Washington, D.C.  
General Offices: 5555 Touhy Avenue, Skokie, Illinois 60076 • Telephone: 312 676-1000 • TWX:  
910-223-3611 and TELEX: 25-4051 (both have 24-hour automatic answering service). Government  
Liaison Office: 425 Thirteenth Street, N.W., Washington, D.C. 20004 • Telephone: 202 ME 8-1016.

CC15M1069  
Printed in U.S.A.





Postage Will Be Paid By Addressee

## BUSINESS REPLY MAIL

No Postage Stamp Necessary if Mailed in the United States

## TELETYPE CORPORATION

Department 1143  
5555 Touhy Avenue  
Skokie, Illinois 60076

FIRST CLASS  
Permit No. 480  
Skokie, Illinois



Thank you for your inquiry concerning

Teletype Corporation equipment.

We hope the enclosed material will help

answer your questions about our data

communications terminals. If you require

any further assistance, please fill in the

attached card, and our representative

will contact you.



Postage Will Be Paid By Addressee

**BUSINESS REPLY MAIL**

No Postage Stamp Necessary if Mailed in the United States

**TELETYPE CORPORATION**

Department 1143

5555 Touhy Avenue

Skokie, Illinois 60076

FIRST CLASS

Permit No. 480

Skokie, Illinois





TELETYPE®  
CORPORATION  
5555 TOUHY AVE. SKOKIE, ILL. 60076

1113

MACHINES  
THAT MAKE  
DATA MOVE



QFR-0710

FD-35 (Rev. 1-1-63)

THIRD CLASS

B

ANOTHER Datamation READER INQUIRY

T NELSON CONS  
BOX 3  
SCHOOLLEYS MTN  
NJ 07870

ADV